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EDITED BY CHARLES T. BRUES

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PSYCHE

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PARTURITION IN PERIPATUS

By Peter R. Morrison

Biological Laboratories, Harvard University,
Cambridge, Massachusetts

Despite numerous and extensive studies on the habits and life history of various of the Onychophora,[1–5] with the exception of Steel [4] who reported no details, there appear to have been no observations on parturition in this group. This is perhaps not surprising when one considers their retiring nature and strong negatively phototropic reactions which make difficult even the observation of the more ordinary activities such as ecdysis and feeding. Since their viviparous mode of reproduction is one of their more unusual characteristics, observations on parturition are of interest.

These peripatus were secured on Barro Colorado Island, C. Z., through the great kindness of Mr. James Zetek. They were taken in September of 1941 and these observations were made in Cambridge about a month later. During the interim they were kept in moist forest debris but were not given additional suitable food. The large female in which successful parturition was observed had an extended length of 60 mm, had 33 pairs of legs and was uniformly colored a rich red-brown. It was *Epiperipatus brasiliensis vagans* Brues,[6] for which the Island is the type locality. Twenty three days previously she had given birth to a single young and another was found just before these observations were made.

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[1] Manton, S. M., Ann. Mag. Nat. Hist., (11) 1:515–528 (1938).

[2] Holliday, R. A., Ann. Natal Mus., 10:237–244 (1942).

[3] Andrews, E. A., Quart. Rev. Biol., 8:155–163 (1933).

[4] Steel, T., Proc. Linnean Soc. New South Wales, 21:94–104 (1896).

[5] Sedgwick, A., Quart. Jour. Micr. Sci., 28:431–493 (1887).

[6] Brues, C. T., Psyche, 32:159–165 (1925).

When first noticed only 4 mm of the young was visible but by 15 minutes later, 16 mm or more than half of its length had emerged. Another 15 minutes sufficed for the young to completely free itself so that the entire process must have required little more than half an hour. During this time the female held the posterior part of her body (that portion bearing the last 5 pairs of legs) raised at an angle of about 60°. She made no movements and no contraction or peristaltic action could be seen. The young on the other hand made active efforts to free itself and apparently maintained a constant tension. The portion of its body which had just emerged (6 mm) was very pale, almost white, and was separated from the rest of the body by a dark band (2 mm). These bands presumably represented extended and contracted regions respectively. The young was closely followed by a drop of white, cloudy, viscous liquid 1.5 to 2.0 mm in diameter. Manton (*loc. cit.*) states that in *Peripatoides* the cast egg membrane, the peritrophic membrane and the cast integument are evacuated after birth but no structure could be seen in this material. The mass was completely eaten by the young in half an hour. After parturition the mother showed no interest in the young even casually walking over it. However, neither did she attempt to harm or consume the young, either at this time or on succeeding days although she had been without food for the better part of a month.

TABLE 1

8:45 A.M.	4 mm. free
9:00	16 “ “
9:05	20 “ “
9:10	24 “ “
9:15	Completely free
9:17	White mass extruded
9:45	Mass consumed by young

With a length of half that of the mother the young appear large but their combined weight was less than 15 per cent of hers. In contrast to the adult which was uniformly colored a rich red-brown, the young showed a lighter red-violet-brown with pinker head, legs and underside. This difference in color appears to be characteristic in peripatus.

An unsuccessful parturition was observed in a smaller individual of another species.[7] Here the young was apparently injured and died when only one fourth extruded. In this case strong contractions of the posterior portion of the female's body were observed but she was unable to complete parturition more than half way. Forceps delivery was resorted to in an attempt to save the adult, but unsuccessfully since she died about 12 hours later. It may well be that this failure was occasioned by placing the animal under observation since the smaller species was characteristically much more active and upset when removed from shelter. The larger species was much more tolerant of observation and for this reason may be particularly suitable material for studies on this group.

TABLE 2

	Pairs of legs	Weight in mg.	LENGTH IN MM.	
			Contracted	Extended
Adult	33	786	50	60
Young #1	33	48	23	33
Young #2	34	54	24	31

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[7] This animal, also from Barro Colorado Island, was one of several *Oroperipatus corradi.* It had a contracted length of 36 mm and was a light chocolate color with a lighter under side and with darker legs and a dark, median dorsal stripe 0.3 mm wide.

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ATHYSANUS ARGENTATUS FABR. IN NEW ENGLAND. (HOMOPTERA)

By Nathan Banks
Holliston, Mass.

Soon after moving to Holliston over twenty years ago I found in my backyard (part of the abandoned "fox-hole" of a glacier) numerous specimens of a large leaf-hopper, and every year since I have taken specimens. It was not in the Hemiptera of Connecticut, nor in Osborn's papers on the Maine and New York Jassidae. Six or eight years ago, being in Washington I spoke to Mr. Oman about it, and he thought it might be a species he had taken the year before near Mt. Washington. Specimens sent him he identified as a European species, *Athysanus argentatus* Fabr., the type of the genus. It occurs where the grass is dense and chiefly near the beginning of the swamp, not in pastures, orchards, or gardens where the economic entomologist would have taken it long ago.

In a trip across Maine from the White Mountains to Bangor I found it in the Pinkham Notch, and at various places in Maine, rather abundant near the Belgrade Lakes. Mr. Moore of Quebec, has shown me a specimen from Peakes Island, Maine, and recently I have seen a few specimens from the Plymouth area of Massachusetts.

It is a pale species, and when fresh the folded wings are silvery white as far each side as the first brown streak in the cells, except that the commissure, claval suture, and first claval vein are brown. There are three brown streaks through the cells and a short one in the fork of medius. The costa is convex, thickened and usually ivory-white. The wing is rather slender, no angle at end of claval suture, so that the brown of the commissure continues straight out and around tip to end of medius; the three apical cross-veins are near each other, there is no second cross-vein. On the head there is a curved black line from eye to eye, the vertex extending somewhat in front of it, more so in middle than elsewhere. The frons shows eight or nine transverse slightly curved lines of pale brown or dark gray each side. There is usually a black mark at base of antenna, and another just above it. The pronotum on hind part is finely, transversely striate; there is a brown line each side, not reaching front, and a short line in front of wing-base. The scutellum has three dark lines, usually visible beneath the pronotum. The abdomen has three black streaks, above and beneath, the median one with irregular edges, the lateral ones situate before margin.

The hind tibiae have a black streak with adjoining dots below; the mid and front femora have a brown line above and another shorter just below it on the front.

This insect is one of several spiders and insects found in my swamp, or near it, that are holarctic; two of the spiders like Athysanus, had not been known from Massachusetts until found here by Mr. Emerton and myself, and like the Athysanus occur in swampy places in North Europe. These forms following the retreat of the glacier became trapped in certain pockets where conditions were favorable for them. All of these forms are mature in early summer, while the several southern forms that I find here are mature only in late summer.

DESCRIPTIONS OF THREE NEW NEOTROPICAL SPECIES OF *CHRYSOPS* (DIPTERA, TABANIDÆ) [1]

By Joseph C. Bequaert

Museum of Comparative Zoölogy, Cambridge, Mass.

Chrysops zayasi, new species (Figs. 1–3)

Female. — Medium-sized, of the group of *C. incisa* Macquart and closely related to *C. frazari* Williston.

Frons about as wide as high, mostly grey pollinose; ocellar area moderately raised, extensive, denuded shiny black and narrowly connected medially with a shiny black upper margin of the callus; frontal callus low, yellowish-brown, separated from the eyes by narrow pollinose orbits. Fronto-clypeus shiny honey-yellow, except for the grey pollinose narrow inner orbits and upper half of cheeks; facial pits yellow; upper lateral areas (above the pits) moderately swollen, not conical. Antennae entirely black, sparsely black-haired, slender, slightly longer than fore femora; segment 1 about one and one-third times the length of 2; 3 slightly longer than 1 + 2; 1 and 2 cylindrical, scarcely swollen, but 1 slightly thicker than 2, particularly seen from above. Palpi honey-yellow. Thorax black; mesonotum with four greyish pollinose longitudinal stripes: one on each side, above the base of the wing, very wide, continuous; a median pair narrow, broadly interrupted before the scutellum, connected anteriorly with the lateral stripes. Scutellum mostly shiny brownish-yellow. Pleura with two broad, yellowish-grey pollinose longitudinal stripes, the upper one interrupted medially. Legs mostly pale yellowish-brown; trochanters, tips of femora and of tibiae, and tarsi more or less infuscated to black; coxae partly grey pollinose; tibiae not widened. Wings hyaline, with dark markings similar to those of *C. incisa*: apical spot well defined as a narrow, continuous stripe along costa, ending at apex of wing and filling in the entire marginal cell; cross-

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[1] Published by a grant from the Museum of Comparative Zoology at Harvard College.

band covering entire 4th posterior (which is narrower at apex than usual) and basal third of 5th posterior cell, continued to the margin along the upper side of the anal cell (which is closed at the apex); no hyaline spot in first submarginal cell in holotype and one paratype (the other paratype has small, drop-line hyaline spots in the distal extension of the cross-band in the first submarginal cell, in the discal cell, and in the apical spot at the tip of the first submarginal cell; this is no doubt an abnormal condition; in every other respect the specimen agrees with the holotype); cross-band abruptly extended in the first submarginal cell, but ending far from the fork of the third vein; basal cells hyaline except for extreme bases and apices. Halteres yellowish-brown, the knobs infuscated above. Abdomen black, with a dorsal pattern of yellowish, grey pollinose markings similar to that of *C. frazari*, but the sides of 1st tergite extensively yellowish; median mark of tergite 2 either hourglass-shaped or divided into two triangles; ventrally two broad, yellowish, grey pollinose stripes, fused anteriorly to cover most of sternites 1 and 2.

Length (not including antennae), 7 to 7.5 mm.; of wing, 8 mm.

Cuba: Cienaga de Lanier, Isle of Pines, March 28, 1945 (Fernando de Zayas Collector); holotype and 1 paratype at M.C.Z. (No. 27434); 1 paratype deposited at the United States National Museum.

C. zayasi is very closely related to *C. frazari* of Hispaniola, a species as yet imperfectly known (see J. Bequaert, 1940, Rev. de Entomologia, XI, p. 282, fig. 1). At present it may be separated by the different shape and color of the antenna (in *frazari* segment 1 and 2 are more swollen and reddish-brown) and by the color of the frontal callus (black in *frazari*).

This interesting addition to the scant tabanid fauna of Cuba was received from Dr. S. C. Bruner, who kindly presented the holotype and one of the paratypes to the Museum of Comparative Zoology.

Chrysops renjifoi, new species (Figs. 4–6)

Female. — Small, related to *C. latitibialis* Kröber and the species described below as *C. weberi*.

Frons very slightly higher than wide (appearing as wide as high in exact front view, as drawn in Fig. 5), mostly grey pollinose; ocellar area very little raised, denuded, shiny black, not extended downward; frontal callus low, black, transverse, with nearly straight sides which are separated from the eyes by narrow pollinose orbits. Fronto-clypeus shiny honey-yellow, with infuscated blotches; upper half of cheeks, very narrow inner orbits and entire outer orbits grey pollinose; facial pits yellow; upper lateral areas (above the pits) flattened convex, not conical. Antennae dirty-yellowish on segment 1, fuscous-brown to blackish on 2 and 3, very slender, much longer than fore femora; segment 1 about one and one-third times the length of 2; 3 scarcely longer than 1, its basal portion very little swollen; 1 and 2 cylindrical, not swollen, equally thick both from above and in profile. Palpi yellowish-brown. Thorax black, fairly shiny, lightly covered with grey pollinosity, which forms two narrow, continuous median lines on the dorsum and is more pronounced on the pleura and on the sides of the dorsum between the wings and the shoulders; no pleural stripes nor spots; scutellum shiny black. Legs mostly infuscated to black; much of fore femora, extreme tips of mid and hind femora, and entire hind tarsi dirty yellowish-white; all tibiæ flattened convex, moderately widened. Wings fairly cloudy over most of the clearer areas, decidedly hyaline only in the two basal and the anal cells; darker markings as follows: costal and subcostal cells, very narrowly connected with the apical spot, which is poorly defined but fills in most of the apex of the wing; it is darkest close to the costa and fades gradually toward the 3d posterior cell; a very narrow, nearly hyaline streak divides it from the distal margin of the crossband, beginning well inside the marginal cell a short distance from the costa; cross-band with nearly straight distal edge, far from the fork of the third vein, divided at the hind margin by an ill-defined, semi-hyaline spot covering much of the 5th and the median portion of the 4th posterior cells; center of discal cell also somewhat paler; base of wing, extreme tips and bases of both basal cells and narrow upper margin of anal cell infuscated; stigma well defined, blackish-brown; anal cell broadly open at apex. Halteres black. Abdomen: 1st tergite yellowish-white, with a narrow black apical margin; 2d tergite yellowish-white over a little more than anterior half, the black hind portion extending forward along the sides; 1st and 2d sternites mostly pale yellowish; remainder of abdomen shiny black, without markings;

yellow of 1st and 2nd tergites slightly grey pollinose, the 1st on each side with a prominent yellowish pollinose spot; all tergites with a few, scattered, short white hairs.

Length (not including antennæ), 5 mm.; of wing, 5.8 to 6 mm.

COLOMBIA: Veneral, Rio Yurumanguí, Dept. Valle del Cauca, March 25, 1943 (Santiago Renjifo Salcedo Collector); holotype and 1 paratype at M.C.Z. (No. 27435).

Chrysops weberi, new species (Figs. 7–8)

Female. — Small, related to *C. latitibialis* Kröber and *C. renjifoi.*

Frons about as wide as high, mostly yellow pollinose and with a few erect black hairs; ocellar area very little raised, extensively denuded, but not extended downward, shiny black with yellowish-brown occipital edge; frontal callus large, strongly swollen, yellowish-brown, barely separated from the eyes. Fronto-clypeus shiny honey-yellow, except for the grey pollinose narrow inner orbits and upper half of cheeks; facial pits yellow; upper lateral areas (above the pits) flattened convex, not conical. Antennae yellowish-brown, paler on segment 1; terminal annuli of segment 3 somewhat more infuscated; very slender, much longer than fore femora; segment 1 scarcely longer than 2; 3 about one and one-half times the length of 1, its basal portion very little swollen, but decidedly thicker than 1; 1 and 2 cylindrical, not swollen, about equally thick both from above and in profile. Palpi yellowish-brown. Thorax black; dorsum with a median pair of broad, continuous, yellow pollinose spots between scutellum and wing and on antealar callosity. Scutellum black, broadly dirty-yellowish along hind and lateral margins. Pleura with a number of disconnected yellow pollinose spots, not definitely forming stripes. Legs: coxae and tibiæ strongly infuscated to blackish; femora and tarsi dirty-yellowish to brownish-yellow, the hind tarsi paler; all tibiæ flattened and moderately widened. Wings marked almost exactly as in *C. renjifoi*, the differences being too slight to justify a figure; the clearer, subhyaline spot near the hind margin of the cross-band is restricted to the middle of the 5th posterior cell; anal cell mostly hyaline. Halteres yellowish-brown. Abdomen: 1st tergite yellowish with a black apical margin; 2d narrowly yellowish at base, but more broadly at the sides; remainder of tergites shiny black, with three longitudinal yellowish stripes, the median one broadest on the 2d tergite where it is connected with the yellow base; the lateral ones less distinct, more or less broken up and extending only over tergites 3 to 6; sternites mostly honey-yellow to fuscous.

Length (not including antennae), 6 mm.; of wing, 6.5 mm.

British Guiana: Oronoque River, in latitude 2°42′N., July 31, 1936, a tributary of the New River in the Courantyne River drainage (N. A. Weber Collector); holotype at M.C.Z. (No. 27436). — Colombia: Mitú, Terr. Vaupés, August, 1943 (P. Allen Collector); paratype at M.C.Z. (No. 27436*a*), somewhat mutilated (lacking antennal segment 3), but agreeing in every respect with the holotype.

The foregoing two species have most of the structural characters (particularly the widened tibiæ) and the wing pattern of *C. latitibialis* Kröber. These three species may be separated by the subjoined key. I have compared the holotype and only known specimen of *latitibialis*, from Kamakusa, British Guiana (M.C.Z. No. 27437).

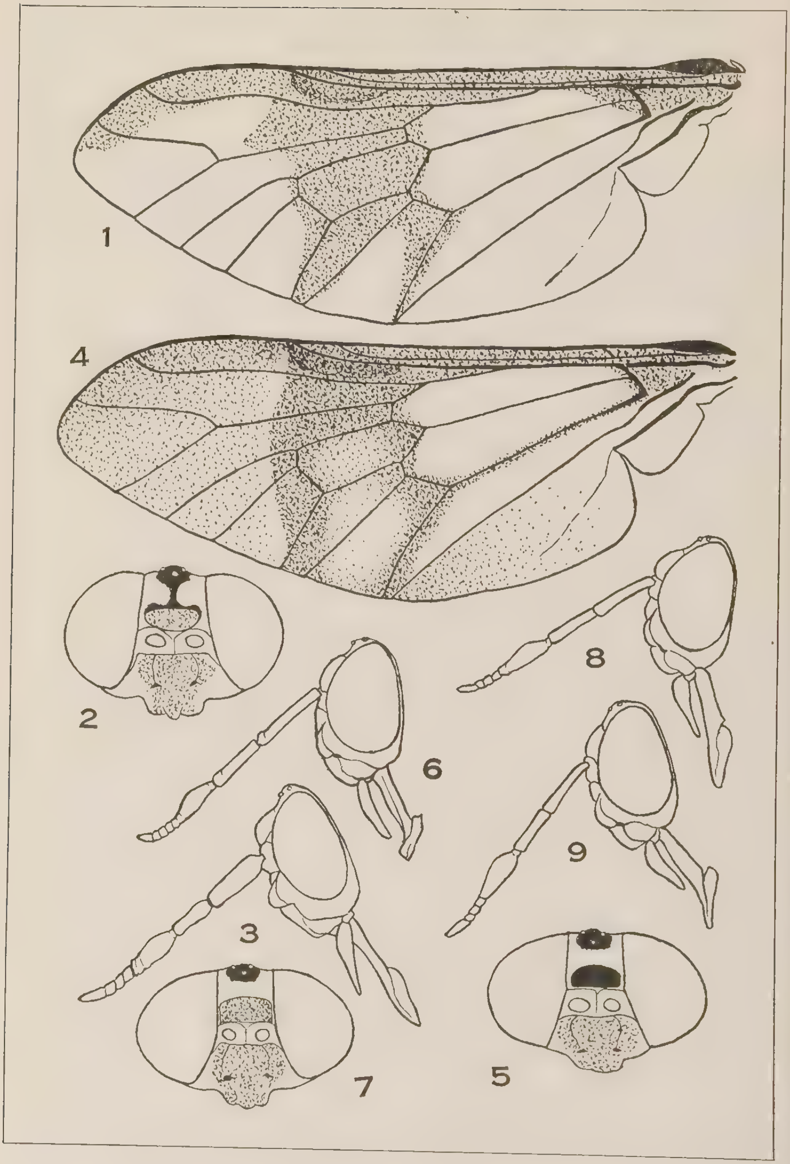
1. Third antennal segment relatively short, scarcely longer than first, its basal portion very slightly widened. Frontal callus black. Mesopleura without spots. Hind femora mostly black. First abdominal tergite pale yellow with a narrow black apical margin; second tergite pale yellow over basal and black over apical half; remaining tergites black, without markings. .... *C. renjifoi.*
   Third antennal segment markedly longer than first. Frontal callus partly yellowish-brown. Mesopleura with pale pollinose spots. Hind femora mostly yellowish-brown. .... 2.

2. Third antennal segment about as long as combined first and second, its basal portion markedly swollen (Fig. 9). First and second abdominal tergites each with a narrow yellowish base, the yellow of the second somewhat extended backward in the middle; remaining tergites black, without markings. .... *C. latitibialis.*
   Third antennal segment much shorter than combined first and second, its basal portion scarcely swollen. First abdominal tergite pale yellowish with black apical margin; second tergite pale yellowish at base and on sides; re-

mainder of tergites black with three yellowish stripes, the median one connected with the base of tergite 2, the lateral ones only on tergites 3 to 6. .... *C. weberi.*

EXPLANATION OF PLATE I.

Figs. 1–3, *Chrysops zayasi* J. Bequaert, female: 1, wing: 2, head in front view; 3, head in profile. — Figs. 4–6, *Chrysops renjifoi* J. Bequaert, female: 4, wing; 5, head in front view; 6, head in profile. — Figs. 7–8, *Chrysops weberi* J. Bequaert, female: 7, head in front view; 8, head in profile. — Fig. 9, *Chrysops latitibialis* Kröber, female, holotype, head in profile.



Bequaert — Chrysops

JUVENILE AND IMAGINAL LUMINESCENCE IN FIRE-FLIES (LAMPYRIDÆ)

By Charles T. Brues
Biological Laboratories, Harvard University

In spite of the extensive literature relating to luminous lampyrids very slight attention has been paid to those forms in which the light-producing organs of the adult beetle are greatly reduced in size and brilliance.

On June 15th the writer collected at Petersham, in central Massachusetts, a number of pupæ which were provided with luminous organs near the tip of the abdomen. In general appearance and in the size, form and position of these organs they resembled the pupæ of one of our common native fireflies, *Photuris pennsylvanica*, which appears abundantly every year at this locality later in the month of June. The pupæ were at the bottom of a pile of old boards that had been thrown into an open field some years ago and were rapidly undergoing final decay and dissolution. Altogether, 54 pupæ were secured and put by in the laboratory to follow the expected development of the imaginal light organs.

Some of these pupæ began to transform into beetles during the following night and their emergence continued for a period of a week. To our surprise, however, the eclosed adults were not Photuris, but another common lampyrid, *Lucidota atra* Fab. represented by individuals of both sexes.

It has been generally observed that the small larval pair of photogenic organs persist in the pupæ and may pass over into the adult, *e.g.*, in *Photinus consanguineus* where the male retains the larval organs in addition to his much larger and separate imaginal one which is developed as a purely adult structure.

Lucidota belongs to a small group of related genera in which the imaginal photogenic organs are feeble and consist entirely of the remains of the precursory juvenile structures. To this group belongs also Pyropyga, a species of which (*P. fenestralis* Mels.) has been observed by Hess[1] to possess larval light organs which continue to function throughout the pupal period. He noted that as the time for emergence of the beetle approaches the glow usually becomes very faint although rarely persisting for a brief period after emergence. Degeneration extends still further in another related genus Ellychnia, and in our common *E. corrusca* no adult luminescence is to be noted, at least in completely matured individuals. The larval organs persist in a degenerating condition in adult beetles as was shown by Williams.[2] Some recent workers do not recognize these several genera as distinct, grouping them all together as Lucidota which is the oldest name.

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[1] Biol. Bull., vol. 38, pp. 39–76 (1920).

The question as to whether the adult photogenic organ in these species should be regarded as vestigial or whether it represents a stage preceding the development of the large and brilliant organ of Photinus is of considerable interest. Inasmuch as luminescence in these beetles has been generally thought to be a sexual manifestation which facilitates mating, we should be inclined to consider the reduced condition in Lucidota as vestigial. On the other hand, the fact that the large adult organ in the male of Photinus is without question a structure developed later and in addition to the persisting larval organs which pass over into the adult without loss of function, we must conclude that the pair of larval organs are phylogenetically older and that the imaginal organ is a more recent acquisition. What purpose the larval organs may serve is not clear. It has been suggested that they may enable the larvæ to recognize one another and it is known that these creatures are gregarious, although not to a high degree. We can hardly admit on this basis that luminous spots can play any real part in the ecology of the larval beetles. Aside from the complex morphology of the brilliant imaginal organs, the integument covering them is greatly modified by the complete loss of pigment. In Lucidota there is no indication of any such change as the ventral abdominal segments are fully blackened in conformity with the general very dark body color of the beetles, and the visibility of the persistent larval organs is effected only through the weakly pigmented, extrusible tip of the abdomen.

It is unfortunate that we do not know more concerning these less spectacular fireflies and the place that they occupy in the evolution of this most varied and remarkable group of luminous beetles.

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[2] Journ. Morphol., vol. 28, pp. 145–207 (1916).

SUPPLEMENT TO THE BIBLIOGRAPHY OF THE DESCRIBED LIFE-HISTORIES OF THE RHOPALOCERA OF AMERICA NORTH OF MEXICO

By V. G. Dethier
Ohio State University

In the Bibliography of the Described Life-Histories of the Rhopalocera of America North of Mexico 1889–1937 (Davenport and Dethier, 1938) an attempt was made to bring up to date the section on Rhopalocera of the Bibliographical Catalogue of Henry Edwards (1889). During the eight years that have elapsed since the appearance of the former not a few new life histories have been described. Lacunae in the descriptions of previously known life histories have also been filled. It is felt that a supplement at this time may be of assistance to those engaged in this field of study. Accordingly the following list patterned after the 1938 bibliography is offered. McDunnough's (1938) check list, which was published after the appearance of the bibliography, is now followed.

For additional data on feeding habits the reader is referred to Comstock (1927), Wolcott (1936), Field (1938), and Hayward (1941).

Papilio polydamas L. Dethier, V. G. Psyche, 47(1): 22–23, 1940 (larva).

Food plant: *Aristolochia argyreoneuron*, *A. ringens*, *A. forckeli*, *A. redicula*, *A. saccata*, *A. tagala*, *A. fimbriata*, *A. brasiliensis*, *A. cymbifera*, *A. elegans*, *A. gigantea*, *A. grandiflora*, *A. glandulosa*, *A. hians*, *A. indica*, *A. Kaempferi*, *A. Roxburghiana*, *A. Ruiziana*, *A. trilobata*.

P. ajax americus Koll. Brown, F. M. Bul. S. Calif. Acad. Sci., 38(3): 200–201, 1939 (larva, chrysalis).

Food plant: "white carrot."

P. celadon Luc. Dethier, V. G. Psyche, 47(1): 22, 1940 (egg).

Phoebis sennae marcellina Cram. Tilden, J. W. Pan.-Pac. Ent., 20: 117, 1944 (life history).

Food plant: *Cassia tomentosa*.

P. agarithe Bdv. Wolcott, G. N. Jour. Agri. Univ. Puerto Rico, 25(2): 123, 1941 (food plant).
Food plant: *Pithecolobium dulcis.*

Eurema lisa Bdv. & Lec. Dethier, V. G. Psyche, 47(1): 21–22, 1940 (larva).
Food plant: *Mimosa pudica.*

Nathalis iole Bdv. Dethier, V. G. Psyche, 47(1): 19–21, 1940 (life history).
Food plant: *Bidens leucantha.*

Ascia monuste L. Wolcott, G. N. Jour. Agri. Univ. Puerto Rico, 25(2): 123, 1941 (food plant).
Food plant: *Cleome gynandra, Allium.*

Danaus menippe Hbn. Wolcott, G. N. Jour. Agri. Univ. Puerto Rico, 25(2): 122, 1941 (food plant).
Food plant: *Asclepias curassavica.*

D. berenice strigosa Bates Dammers, C. M. Bul. S. Calif. Acad. Sci., 36(1): 23–24, pl. 10, 1937 (food plant).
Food plant: *Philibertia heterophylla, Stapelia.*

Argynnis nokomis Edw. Comstock, J. A. Bul. S. Calif. Acad. Sci., 39(1): 76, 77, pl. 8, 1940 (egg).
Food plant: *Viola.*

A. leto Behr Comstock, J. A. Bul. S. Calif. Acad. Sci., 39(1): 75–77, pl. 8, 1940 (egg, larva).
Food plant: *Viola.*

A. hydaspe viridicornis Comst. Comstock, J. A. Bul. S. Calif. Acad. Sci., 39(1): 76, 77, pl. 8, 1940 (egg).
Food plant: *Viola.*

A. callippe comstocki Gund. Comstock, J. A. Bul. S. Calif. Acad. Sci., 39(1): 76, 77, pl. 8, 1940 (egg).
Food plant: *Viola.*

Euphydryas chalcedona Dbldy. & Hew. Dammers, C. M. Bul. S. Calif. Acad. Sci., 39(2): 123–125, 1940 (food plant).
Food plant: *Scrophularia antirrhinoides* Benth., *Buddleia.*

E. cooperi Behr Doudoroff, M. Canad. Ent., 69(5): 117–118, 1937 (larva).

E. gillettii Barnes Comstock, J. A. Bul. S. Calif. Acad. Sci., 39(2): 111–113, pl. 20, 1940 (egg, larva).
Food plant: *Lonicera involucrata* Banks.

Junonia genoveva Cram. Wolcott, G. N. Jour. Agri. Univ. Puerto Rico, 20(1): 399, 1936 (larva, chrysalis).
Food plant: *Valerianoides jamaicensis.*

Anartia jatrophae Joh. Wolcott, G. N. Jour. Agri. Univ. Puerto Rico, 20(1): 399, 1936 (larva, chrysalis).
Food plant: *Bacopa monniera.*

Anartia jatrophae jamaicensis Moesch. Dethier, V. G. Psyche, 48(2/3): 71–73, pls. 5–6, 1941 (egg, larva).
Food plant: *Lippia.*

Victorina steneles L. Wolcott, G. N. Jour. Dept. Agric. Puerto Rico, 7(1): 1924 (larva, chrysalis).
Food plant: *Blechum brownei.*

Historis orion Fabr. Smyth, E. G. Fourth Rept. Bd. Comm. Agri. Puerto Rico, 1914–15: 45–50, 1916 (larva, chrysalis). Wolcott, G. N. Jour. Agri. Univ. Puerto Rico, 20(1): 401, 1936 (larva, chrysalis).
Food plant: *Cecropia peltata.*

Eumaeus atala Poey Dethier, V. G. Psyche, 48(2/3): 75, pl. 6, 1941 (larva, chrysalis).

Mitoura spinetorum Hew. Comstock, J. A. and Dammers, C. M. Bul. S. Calif. Acad. Sci., 37(1): 30–32, pls. 3–4, 1938 (life history).
Food plant: *Arceuthobium campylopodum* Engelm.

Leptotes theonus Luc. Wolcott, G. N. Jour. Agri. Univ. Puerto Rico, 25(2): 123, 1941 (food plant).
Food plant: *Crotalaria incana.*

Hemiargus hanno Stoll. Dethier, V. G. Psyche, 47(1): 24, 1940(egg, larva). Wolcott, G. N. Jour. Agri. Univ. Puerto Rico, 25(2): 123, 1941 (food plant).
Food plant: *Mimosa pudica, Macroptilium lathyroides.*

Polygonus amyntas Fabr. Wolcott, G. N. Jour. Agri. Univ. Puerto Rico, 20(1): 407, 1936 (larva). Wolcott, G. N. Jour. Agri. Univ. Puerto Rico, 25(2): 124, 1941 (food plant). Dethier, V. G. Psyche, 49 (1/2): 5–6, 1942 (larva).
Food plant: *Ichthyomethia piscipula, Lonchocarpus, Derris eliptica.*

Proteides idas Cram. Wolcott, G. N. Jour. Agri. Univ. Puerto Rico, 25(2): 124, 1941 (food plant).
Food plant: *Derris eliptica.*

Urbanus dorantes Stoll. Dethier, V. G. Psyche, 49(1/2): 4–5, 1942 (egg, larva).
Food plant: *Clitorea* and related genera.

Cabares potrilla Luc. Dethier, V. G. Psyche, 47(1): 24–25, pl. 3, 1940 (egg).

Pyrgus syrichtus Fabr. Dethier, V. G. Psyche, 47(1): 24, pl. 3, 1940; 49(1/2): 6–7, 1942 (life history).
Food plant: *Sida*.

P. communis occidentalis Skin. Dethier, V. G. Bul. S. Calif. Acad. Sci., 43(1): 30–32, pl. 11, 1944 (life history).
Food plant: *Sidalcea*.

Achlyodes thraso Hbn. Wolcott, G. N. Jour. Dept. Puerto Rico, 7(1): 1924 (larva, chrysalis).
Food plant: *Citrus*, *Zanthoxylum monophyllum*.

Ancyloxypha numitor Fabr. Dethier, V. G. Canad. Ent., 71: 118, 1939 (larva). Dethier, V. G. Bul. S. Calif. Acad. Sci., 37(2): 74–77, pls. 18–20, 1938 (life history).
Food plant: Grasses.

Hesperia juba Scud. Lindsey, A. W. Denison Univ. Bul., Jour. Sci. Lab., 20: 121–125, pl. 16, 1923 (egg, larva).
Food plant: Grasses.

H. leonardus Harr. Dethier, V. G. Canad. Ent., 71: 118, 1939 (egg, larva).
Food plant: Grasses.

Polites verna Edw. Dethier, V. G. Canad. Ent., 71: 117–118, 1939 (egg, larva).
Food plant: Grasses.

P. manataaqua Harr. Dethier, V. G. Canad. Ent., 70: 255, 1938 (egg, larva). Dethier, V. G. Bul. S. Calif. Acad. Sci., 40(2): 109–111, pls. 8–9, 1941 (larva).
Food plant: Grasses.

P. themistocles Latr. Dethier, V. G. Canad. Ent., 70: 255–256, 1938 (egg, larva). Dethier, V. G. Bul. S. Calif. Acad. Sci., 41(1): 41–43, pl. 9, 1942 (larva, chrysalis).
Food plant: Grasses.

P. baracoa Luc. Dethier, V. G. Psyche, 46(4): 148–149, pl. 9, 1939 (egg, larva).
Food plant: Grasses.

P. peckius Kby. Dethier, V. G. Bul. S. Calif. Acad. Sci., 38(3): 188–190, pl. 50, 1939 (life history).
Food plant: Grasses.

P. sabuleti Bdv. Dethier, V. G. Bul. S. Calif. Acad. Sci., 42(3): 128–131, pl. 13, 1943 (life history).
Food plant: Grasses.

P. mystic Scud. Dethier, V. G. Canad. Ent., 70: 256–257, 1938 (egg, larva). Dethier, V. G. Bul. S. Calif. Acad. Sci., 39(2): 108–110, pl. 19, 1940 (larva, chrysalis).
Food plant: Grasses.

Catia ortho egeremet Scud. Dethier, V. G. Canad. Ent., 70: 257–258, 1938 (egg, larva).
Food plant: Grasses.

Poanes hobomok Harr. Dethier, V. G. Canad. Ent., 70: 258–259, 1938 (egg, larva).
Food plant: Grasses.

P. radians Luc. Dethier, V. G. Psyche, 46(4): 150–151, pl. 9, 1939 (egg, larva).
Food plant: Grasses.

P. haitensis Skin. Wolcott, G. N. Jour. Dept. Agri. Puerto Rico, 5(2): 1–47, 1921 (life history).
Food plant: Sugar cane.

Lerodea tripunctus H.–S. Dethier, V. G. Psyche, 46(4): 151–152, pl. 9, 1939 (larva, chrysalis). Dethier, V. G. Mem. Soc. Cubana Hist. Nat., 16(2): 167–176, pl. 26, 1942 (life history).
Food plant: Grasses, sugar cane.

Panoquina sylvicola H.–S. Jones, T. H. and Wolcott, G. N. Jour. Dept. Agri. Puerto Rico, 6(1): 38–50, fig. 11, 1922 (life history). Wolcott, G. N. Jour. Dept. Agri. Puerto Rico, 6(1): 32–37, 1922 (larva, chrysalis). Wolcott, G. N. Jour. Agri. Univ. Puerto Rico, 20(1): 411, 1 fig., 1936 (larva). Dethier, V. G. Psyche, 46(4): 152–153, pl. 9, 1939 (egg, larva). Dethier, V. G. Mem. Soc. Cubana Hist. Nat., 16(2): 167–176, pl. 26, 1942 (life history).
Food plant: Grasses, sugar cane, bamboo, rice.

P. nyctelius Latr. Jones, T. H. and Wolcott, G. N. Jour. Dept. Agri. Puerto Rico, 6(1): 38–50, figs. 9, 15, 1922 (life history). Wolcott, G. N. Jour. Dept. Agri. Puerto Rico, 6(1): 32–37, 1922 (larva). Wolcott, G. N. Jour. Agri. Univ. Puerto Rico, 20(1): 410, 1 fig., 1936 (larva). Dethier, V. G. Psyche, 46(4): 153–154, pl. 9, 1939 (larva, chrysalis). Dethier, V. G. Mem. Soc. Cubana Hist. Nat., 16(2): 167–176, pl. 26, 1942 (life history).
Food plant: Grasses, sugar cane.

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DICHELONYX CANADENSIS HORN

By C. A. Frost
Framingham, Mass.

In his monograph of this genus in the Trans. Am. Ent. Soc. Vol. XXVII, 1901, Mr. H. C. Fall writes, "This species is quite unknown to me nor do I know if there are any in collections besides the type." The only locality given in Leng's list is "Can." which is evidently the locality given by Horn in his description in 1876.

Specimens in my collection taken by me at Paris, Maine are dated: — June 17, 1912, July 15, 1913, June 10, 1925, June 30, 1932, July 6, 1933. and July 7, 1937. Some of them are labelled as swept from *Corylus rostrata*, or taken on the leaves of this plant where they were observed feeding. On June 22, 1945, while eating lunch in the shade of a large white pine on the edge of an open pasture, I noticed a couple of specimens on the grass stems in front of me. Later some unexplained desire to enter the dense shadows of the pines and hemlocks behind me was acted on. There I found this beetle flying over the forest floor in great numbers; they flew from one to three feet high frequently coming to rest on the ground or on fallen twigs and branches, for a few moments only in many cases; no copulation was observed. 106 specimens were taken and their numbers seemed to be but little diminished at the end of an hour, which was between 1 and 3 P.M. On the following day some specimens were noticed; on the third day there were none to be seen, but for several days after occasional specimens were seen on the Corylus leaves about a quarter of a mile away.

NOTES ON UNCOMMON COLEOPTERA

By C. A. Frost
Framingham, Mass.

Melanotus tænicollis Lec. Three specimens of this Elaterid have been taken in the past 45 years at Framingham. One specimen on June 1, 1912, one on June 27, 1915, by sweeping in a meadow, and one on June 2, 1945, near the railroad yards a few hundred yards from my home.

Stenotarsus hispidus Hbst. Four specimens have been taken in recent years near here. One by sweeping on Sept. 23, 1933, two on June 10, 1939, and one by sifting on April 1, 1944.

Triplax macra Lec. Three exactly typical specimens were taken at Paris, Me. on June 29, 1945, on fungi on dead poplar. One typical specimen from Prince Edward Co., Ont. collected by Brimley is at hand, and another labelled, "Zebulon, Ga. 4–14–38. P. W. Fattig" seems to be a typical specimen. Two other specimens which were named by others for me appear to be entirely different and maybe undescribed.

Ephistemus apicalis Lec. This minute beetle which is attached rather loosely to the family *Cryptophagidæ* in the list is recorded from N.Y.-Ind. They appear in very large numbers in old grass piles in the layer just below the dry top one here in Framingham. My specimens are labelled: Sherborn, Oct. 8, 1933, Framingham, Sept. 11, 1910, and Framingham, May 29, 1931, under dead musquash. Specimens of what appear to be this species are at hand from Mineral Springs, Ind. and from McMinnville, Ore., March 1, 1935 and May 20, 1941.

Pachybrachys pubescens Oliv. This species was not recorded east of Watkins, N. Y. by Fall in his monograph of the genus. On June 10, 1945, one specimen was taken on a red oak leaf at Natick, Mass. and another specimen escaped.

AFRICAN BEES OF THE GENUS ANTHOPHORA [1]

By T. D. A. Cockerell
Boulder, Colorado

The bees recorded below were kindly sent by Dr. J. Bequaert and are in the Museum of Comparative Zoölogy.

Anthophora regalis, new species

♀. Length about 14 mm.; very robust, black, the abdominal tergites 1 and 4 having broad bands of brilliant purple; hair of head and thorax mixed greenish and black, on thorax beneath and on cheeks white, the occiput with a fringe of bright green hairs, with longer black hairs behind them; face markings yellowish-white; clypeus with a reversed T, the stem slender, but broadening before the arms, which do not reach lateral borders; supraclypeal area with a small triangular mark; labrum broad, with laterobasal black spots and a narrow black margin, apical part of labrum brownish; mandibles broadly pale at base; flagellum obscurely brownish beneath; tegulæ black; wings rather dilute fuliginous; front and middle legs with pale pubescence, hind legs with black, except a sharply defined pubescent band along the whole length of hind tibia behind; descending face of first tergite with pale hair; fifth tergite with a large transverse bilobed patch of grey hair, but otherwise with black hair.

Cameroons: Metet (*G. Schwab*).

Related to *A. expleta* Vachal, but that has the bands pale blue becoming white laterally. *A. vivida* Smith, type ♀, has the hind tibiæ all black, but a variety has a tuft of white at apex behind; *A. vivida* has emerald green bands, and no band on first tergite.

Anthophora armata Friese

Kenya: Taveta (*A. Loveridge*). ♂.

Anthophora torrida F. Smith

Tanganyika Territory: Kilosa, Dec. 11, 1920 (*A. Loveridge*). Kenya: Mombasa (*G. M. Allen* and *G. Brooks*). Liberia: Monrovia, July (*J. Bequaert*).

These are females. I have examined Smith's type.

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[1] Published by a grant from the Museum of Comparative Zoology at Harvard College.

Anthophora katangensis Cockerell

Cameroons: Metet (*G. Schwab*). ♂.

Anthophora flavicollis loveridgei, new subspecies

♀. Exactly the size and aspect of *A. flavicollis* Gerst., with the thorax red-haired above, and the abdomen entirely black, but with no band of red hair beneath the wings, and the thorax broadly black-haired in front as far back as the red tegulæ. The statement that the abdomen is all black must be qualified by reference to the apical fringe of white hair, which is as in *A. flavicollis*. It is broadly interrupted in the middle. The clypeal mark, broadened at lower end, is white. A second specimen has the black on anterior part of thorax less developed, taking the form of two lobes, but continuous along the margin in front.

Tanganyika Territory: Kilosa, January 7, 1922 (*A. Loveridge*).

Anthophora flavicollis Gerstaecker

Belgian Congo: Village of Malela (Chief Kansende), 5° 40′ S., 23° 45′ E. (*J. Bequaert*).

Anthophora africana Friese

Tanganyika Territory: Kilosa, April 4, 1922 (*A. Loveridge*).

Anthophora cincta Fabricius

Liberia: Gondalahun (*J. Bequaert*).

Anthophora centralis Cockerell

Cameroons: Metet (*G. Schwab*).

Anthophora ugandae Meade-Waldo

Cameroons: Metet (*G. Schwab*).

Anthophora advena F. Smith

Tanganyika Territory: Kilosa, ♀, January 7, 1922; ♂, April 14, 1922 (*A. Loveridge*). Also a female from Zanzibar (*C. Cooke*).

Anthophora advenula Cockerell

Cameroons: Metet (*G. Schwab*).

Very like *A. triangulifera* Ckll., but easily distinguished by the form of the labrum.

Anthophora adveniformis, new species

♂. Length about 16.5 mm.; robust; black, the thorax above covered with bright red hair; the abdomen with no light hair on first three tergites, but fourth (except at base), fifth and sixth covered with greyish-white hair, and long white hair at side of fifth and sixth; middle and hind legs with black hair, anterior tibiæ and tarsi on front with white hair; tegulæ red; wings dilute fuliginous. Scape all black, flagellum long. Face broad, face-markings orange, consisting of a long transverse supraclypeal mark, pointed at each end, a band on each side next to clypeus, a reversed T-shaped mark on clypeus, the stem with the end very slender, reaching top of clypeus, but the lower end greatly broadened (with a keel in middle), the lateral arms short; labrum orange, the apical margin dark and the basal spots small; mandibles pale at base; cheeks with long pure white hair. The anterior part of thorax has long white hair below.

CAMEROONS: Metet (*G. Schwab*).

It looks exactly like a female *A. advena* Smith, but the face marks at once distinguish it, and it is very different from male *A. advena*. It is closely allied to *A. albocaudata* Dours, but is more robust, with different face-markings.

Anthophora plumipes (Fabricius)

CAPE PROVINCE: Willowmore, January 1, 1904 (*H. Brauns*).

According to Dalle Torre's Catalogue this was said to come from India, which is impossible. F. Smith says it is in the Banks Collection at the British Museum. I presume that this is the actual type, and it should be examined and described in modern terms. I did not see it when working at the British Museum, as the Banks Collection is kept separate, and it did not occur to me to look for the type of *A. plumipes*. Dours treats *A. atrocincta* Lepeletier as a valid species, with *A. plumipes* as a synonym, in spite of the long priority of the latter. He gives Caffraria as the locality. However, Lepeletier described *A. atrocincta* from a male from Senegal, with white face-marks, and scape yellow in front. The South African form has a light mark on the male scape. Supposing that the South African bee could be distinguished, at least as a subspecies, from true *A. atrocincta*, I thought perhaps the name *A. domicola* Ckll., based on a bee from Benguella, might be applicable, but this is a smaller species, and the very short scape is entirely black.

Male *A. plumipes* from Tenke in the Katanga has only a small light mark on the scape, and the labrum is conspicuously shorter than in the S. African form. Thus it seems probable that we should recognize several subspecies of this widely distributed bee, and that *atrocincta* Lep. is not applicable to any of those now before me. Which is the true or typical *A. plumipes* we do not know, but if the Fabricius type is found, that point can be settled. It is quite possible that the South African form (from Huguenot in the west to Zanzibar in the east) may need a new subspecific name.

Anthophora spinicauda, new species

♂. Length about 10 mm.; black, with the face-markings very pale yellow, including clypeus (with only a small spot on each side), narrow supraclypeal band, not angulate above, lateral marks filling space between clypeus and eye, sending a line a short distance up eye margin, stripe on scape, labrum and base of mandibles; face shining, but clypeus dull in middle; flagellum short for a male, very obscurely brownish beneath; hair of head and thorax above light fulvous, not mixed with black, of cheeks pure white, of sides of thorax greyish; wings slightly dusky; legs black, hair of middle and hind legs entirely black, but front femora with a long fringe of pure white hair; abdomen broad, covered with ferruginous hair, with an appearance of broad pallid bands; apex with a single median spine. The eyes are dark red.

Tanganyika Territory: Morogoro, June 1 (*A. Loveridge*). Superficially like *A. vestita* Smith, but differing in the black hair of the legs and the apical spine of abdomen. By the black-haired middle and hind legs this resembles the much larger *A. africana* Friese. *A. vestitula* Ckll. was described from the female, with black hair on hind legs, but the hair of the thorax is quite differently coloured.

Anthophora malelana, new species

♀. Similar to *A. ogilviei* Ckll., the face marks as in the male of that species, but with the widely separated quadrate black marks not at all produced downward at inner apical corner; the apical yellow band of clypeus is very wide, and the lateral face marks slope downward from the upper end next to corner of clypeus, but on approaching the orbit, send a pointed projection upward; the labrum is very large, and the basal spots are pale; the scape is light red (a unique feature), with a small yellow stripe on upper part; flagellum red beneath. Hair of head and thorax above pubescent; abdominal bands five, clear but rather dull white, not flavescent; the fifth band is thin, showing the black surface; hind tibiæ on under side with white hair, on which is a large black stripe, extending nearly the whole length; hind basitarsi with abundant black hair, and no light tuft. Face marks very pale yellow; wings dusky.

Belgian Congo: Village of Malela (Chief Kasende), near the Lubilash River, 5° 40′ S., 23° 45′ E. (*J. Bequaert*).

DESCRIPTION OF *HABROCESTUM PARVULUM* (BANKS) [1]

Sarah E. Jones
Texas State College for Women

Discovery of a male *Habrocestum parvulum* (Banks) taken from William Trelease Woods, University of Illinois, on Sept. 25, 1939, and two females, taken on Sept. 16, 1944, and Jan. 14, 1945, led to examination of the specimens in the collection in the Museum of Comparative Zoölogy, Harvard University. The male holotype is redescribed, and the female is described for the first time.

Male. Length 3.25 mm.; ceph. 1.75 mm. long, 1.25 mm. wide; abd. 1.5 mm. long; *cephalothorax* brown, ocular area darker with a posterior median emargination in dark area; lighter band across thorax behind eyes, and radiating dark lines on thorax; margin black; clypeus brown, darker around eyes, where are short white hairs; white hairs above anterior eye row and scattered over cephalothorax, which is high, sloping slightly forward and strongly backward from hind third, widest behind last eyes, with sides almost parallel; *clypeus* sloping posteriorly, one-half as wide as anterior median eyes; *eyes*, ant. row bulging, slightly recurved by posterior margins, medians almost twice the diameter of laterals, second row slightly nearer hind row, which is narrower than thorax; quadrangle one-fourth wider than long, narrower behind, occupying less than one-half of cephalothorax; *sternum* pale, longer than wide, with coxæ I separated by more than width of labium, coxæ IV contiguous; *labium* pale, as long as wide; mandibles reddish, paler below, with one tooth on lower fang groove, none above; *abdomen* cream, with narrow oblique black lines laterally, leaving a pale line bordering abdomen anteriorly and passing back laterally to hind third of abdomen; on dorsum are three pairs of light spots, the first two confluent; posteriorly are four light crossbars and a light spot above the pale spinnerets; *venter* pale,

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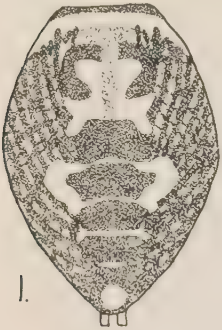
[1] Published by a grant from the Museum of Comparative Zoology at Harvard College.

with a median longitudinal band and a pair of crescentic lateral lines black; *legs* (removed from holotype, and described from male taken with female allotype) brown, first pair darker, black on patella and tibia, with last two joints light, 4–3–1–2; spines, I pair, tibia, ventral, 2–2–2, prolateral, 1 distal, metatarsus, ventral, 2–2, twice the diameter of the joint; II pair, tibia, ventral, 1–2–2, prolateral, 1 distal, metatarsus as in I pair, no dorsal basal spine on last two pairs of tibiæ; *palp* black, patella slightly longer than tibia, which is slightly longer than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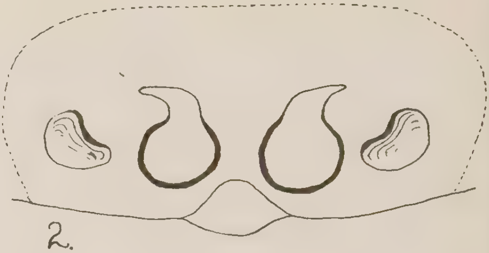
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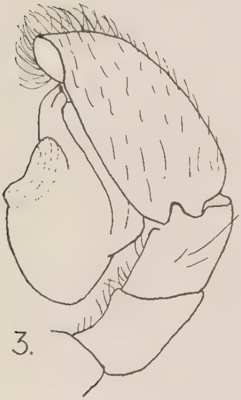
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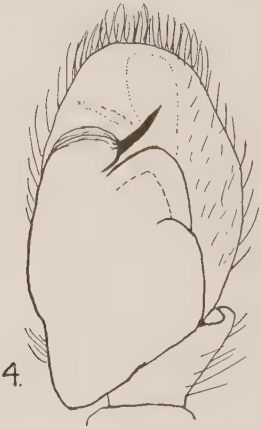
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Fig. 1. Dorsum of male abdomen.
Fig. 2. Epigynum.
Fig. 3. Male palp, lateral view.
Fig. 4. Male palp, ventral view.

wide, and longer dorsally than ventrally; apophysis short, hooked inward; embolus almost straight; bulb projecting ventrally and extending well over tibia.

Female. Length 3.5 mm.; ceph. 2.0 mm. long, 1.5 mm. wide; abd. 1.75 mm. long; *cephalothorax* colored as in male, but eye area black, transverse line behind eyes more distinct, and no radiating lines on thorax; hairs as in male, with also dark hairs above anterior eye row, longest between anterior eyes and below middle eye row; *eyes*, *sternum*, *labium*, and *mandibles* as in male; *abdomen* pale, mottled with black forming thin longitudinal lateral lines, dorsum with a large pair of light spots on anterior edge, two smaller pairs at mid-length, and four light cross-bars posteriorly; venter as in male; legs brown, 4–3–1–2, spines as in male; *palp* brown, outer two joints slightly swollen, with long stiff hairs ventrally and medially; *epigynum* with large median droplet-shaped spermathecæ and smaller lateral vulval openings.

Holotype, Ithaca, N. Y. (N. Banks Collection). Allotype, Ithaca, N. Y., May 21, 1911. Coy Glen (N. Banks Collection). Taken with the allotype were one male and three immature specimens.

In the male from Illinois the cephalothoracic colors are more sharply contrasted than in the types. The male tibial apophysis is less blunt than in *H. pulex* (Hentz); the bulb protrudes as much posteriorly as in *pulex*, and much farther ventrally; and the embolus is less whorled than in *pulex*. The epigynum is distinctive in having the spermathecæ medial to the vulval openings.

CICINDELA FORMOSA GENEROSA DEJ.

By C. A. Frost
Framingham, Mass.

Probably the most easterly locality for this variety at present known is in the large sand blow-out in Freeport, Me. known as the "Desert of Maine." Having no net with me on the visit to this place I was able to take but one specimen there on June 11, 1938. This locality is about 20 miles easterly and 34 miles southerly from the locality at Paris, Me. where it occurs. I also took specimens near the shore of Lake Webb in Weld, Me. on June 30, 1938. This place is about 34 miles north and a few miles easterly from Paris.

I have not seen any other records from Maine before or since I took it on the sand dunes back of the beach at Ogunquit on Sept. 17, 1903. This locality is about 100 miles south of Weld and 50 miles southwest of Freeport.

Weld, Me. is some 500 miles south of the locality in Canada where the variety *manitoba* Leng is found. Concerning this variety it may be well to point out that hasty statements based on insufficient material are of no great scientific value. In a fairly recent paper the author writes: — "This has always been considered a variety, but because of its restricted occurrence in the north it should be known as *Cicindela formosa* subspecies *manitoba*." Since I have specimens from Iowa, Nebraska and Kansas this statement has no weight. Moreover I have taken a specimen here in Framingham, Mass. which is almost an exact duplicate of a specimen from Manitoba labelled, "*manitoba* Leng, Topotypical." In mine the white area at the humeri is slightly narrower. My series of 94 specimens of *formosa* can be arranged to show in markings a nicely integraded series from the species to the varieties *generosa* and *manitoba*. Specimens occur not uncommonly here in New England which have a quite marked coppery color.

SPECIAL A.A.A.S. MEETING

The Cambridge Entomological Club will hold a special meeting in conjunction with the meetings of the American Association for the Advancement of Science in Room 455, Biological Laboratories, Harvard University, at 8:00 P.M. on Thursday, December 26th.

The meeting will be addressed by Professor Clarence H. Kennedy of Ohio State University, whose subject will be: "The Child Labor of the Termites versus the Adult Labor of the Ant Society." An informal social gathering will follow. Visitors will be welcome.

CAMBRIDGE ENTOMOLOGICAL CLUB

A regular meeting of the Club is held on the second Tuesday of each month (July, August and September excepted) at 8:00 p.m. in Room B-455, Biological Laboratories, Divinity Ave., Cambridge. Entomologists visiting Boston are cordially invited to attend.

FOR SALE

The Librarian of the Museum of Comparative Zoology is offering for sale a limited number of sets of the "CONTRIBUTIONS FROM THE ENTOMOLOGICAL LABORATORY OF THE BUSSEY INSTITUTION." These are priced at $15.00 f.o.b., Cambridge, Massachusetts.

Each set includes reprints of 292 entomological papers which appeared in various entomological and zoological journals published during the period from 1909 to 1929. These form seven large volumes each substantially bound in red buckram, and a number of additional reprints to form an eighth volume. Altogether there are more than 5800 pages included. Shipping weight is approximately 50 pounds.

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